Water

P.E.I.'s MOST PRECIOUS RESOURCE

NEW LONDON BAY COMPLEX

WATERSHED ACTIVITIES

SURFACE WATER PROGRAM

MARCH 1990

THE CANADA—PRINCE EDWARD ISLAND
WATER MANAGEMENT AGREEMENT

Environment Canada Environnement Canada

Prince Edward Island
Department of the Environment

NEW LONDON BAY COMPLEX

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WATER MANAGEMENT AGREEMENT

Prepared by:

Environment Canada
Inland Waters Directorate
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P.E.I. Department of the Environment
Fish and Wildlife Branch

SURFACE WATER PROGRAM

MARCH 1990

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PREFACE

This report is one of a series produced as a result of the Canada - Prince Edward Island Water Management Agreement. The work was performed as part of the Watershed Inventory Project under the Surface Water Program.

It was initiated in order to gain a better understanding of the activities which may impact on the quality and quantity of surface waters drained by the Hope, French, Stanley and Southwest Rivers into New London Bay.

The report is intended to be used in conjunction with the report entitled "Activities Affecting Surface Water Resources - A General Overview" and the book of "New London Bay Watershed Complex Inventory Maps" which is maintained on file at Inland Waters Directorate, Environment Canada in Dartmouth, Nova Scotia. All references to maps in this report are to the atlas.

Mapping was performed on the 1:50,000 N.T.S. topographical series using the Universal Transverse Mercator (U.T.M.) grid system to the nearest one hundred (100) metres for point data. Non-point (polygon) data was also mapped where applicable. This mapping technique is easily transferable to the Geographical Information System (G.I.S.) which can provide for updating and manipulation of the data.

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1.0 INTRODUCTION

In November 1987, the Canada - Prince Edward Island Water Management Agreement was signed. The Agreement focuses upon several areas including groundwater contamination, surface water degradation and estuarine eutrophication. Of these, the Watershed Inventory Project, as part of the Surface Water Program, has been designed to identify current and future users of surface water and to document resource conflicts within twelve watersheds across the province. The New London Bay Watershed Complex (Figure 1.1) was identified as an area of study for the project.

2.0 GENERAL CHARACTERISTICS OF THE NEW LONDON BAY WATERSHED COMPLEX

2.1 Physiography

The New London Bay Watershed Complex is located mostly in the northwest section of Queens County, P.E.I. except for a small intrusion into the northeast section of Prince County. The French, Hope, Southwest and Stanley Rivers all drain a number of tributaries before emptying into New London Bay. The Bay then opens to the north through a narrow channel into the Gulf of St. Lawrence.

The several glaciers which at one time covered Prince Edward Island have caused a gently undulating terrain across much of the province. Average elevations within the province are less than sixty-one (61) metres above sea level. The New London Bay Watershed Complex encompasses a diverse section of the Island. The southernmost areas within the watershed are very hilly with maximum elevations exceeding one hundred and twenty-two (122) metres while the northern sections are much flatter.

The area is largely rural with farms and small village located throughout. As is the case with the Island as a whole is traversed by an extensive network of roads. Many are unpaved and are not kept open during the winter months.

A physiographic comparison between the province of Prince Edward Island and the New London Bay Watershed Complex has been carried out by Inland Waters Directorate, Environment Canada, Dartmouth, Nova Scotia (Taylor, 1989). The watershed contains mostly cleared land while the bulk of the remainder is wooded. Estuaries account for over ten percent of the total area (Figure 2.1). The watershed drains a landbase of about two hundred and forty-two square kilometres (241.99 km^2). The total length of the four major rivers and their tributaries is approximately two hundred and forty kilometres (240.73 km). Physiographic data for the lands drained by each river is not

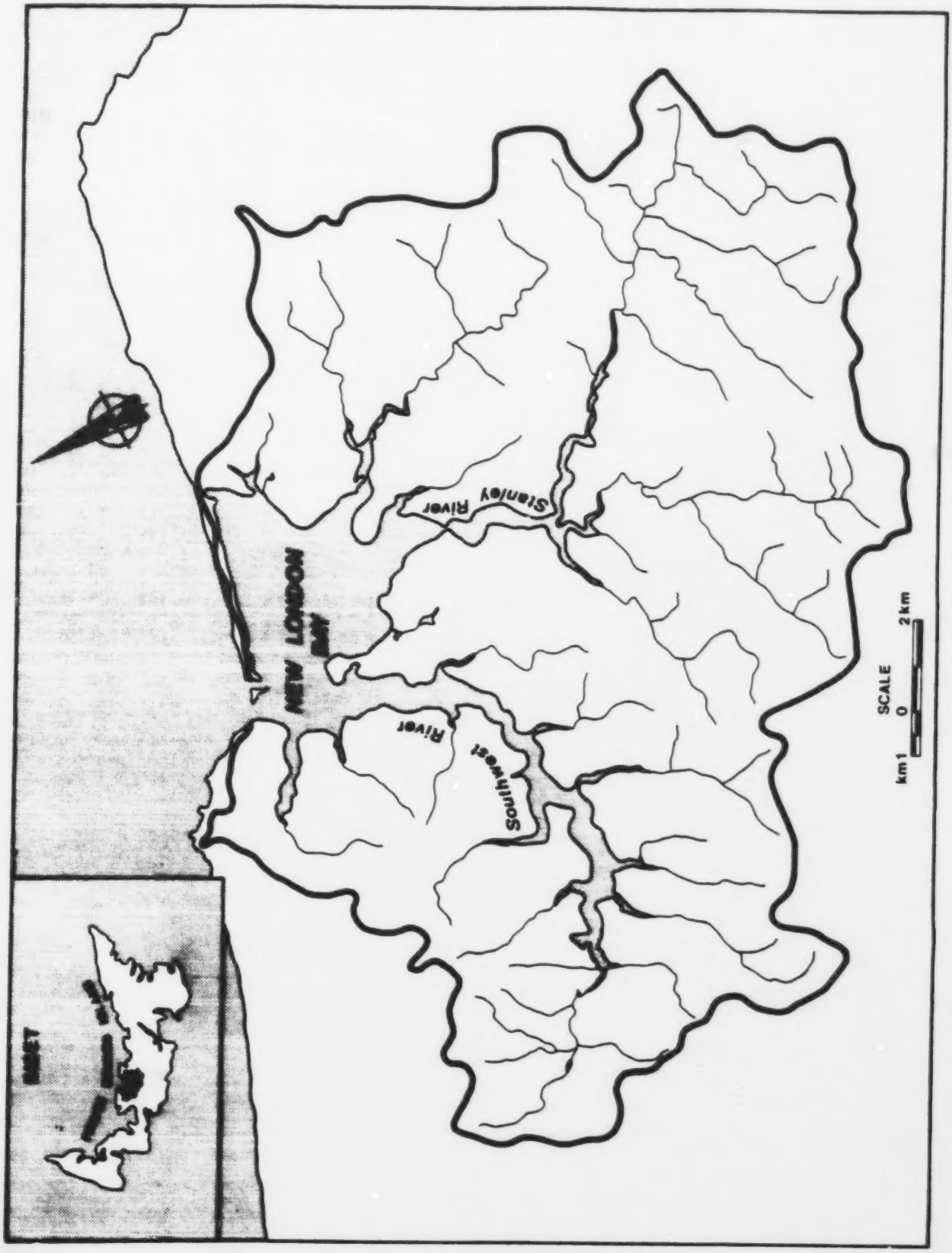
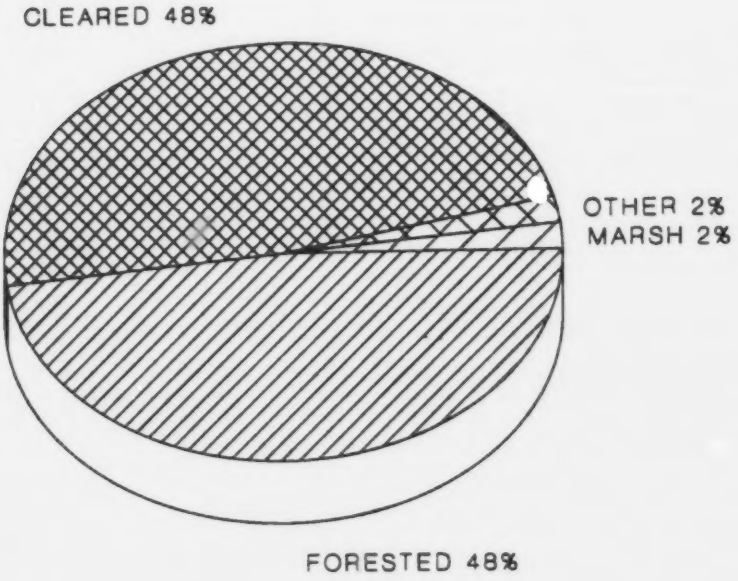


Figure 1.1 New London Bay Watershed Complex

PRINCE EDWARD ISLAND



NEW LONDON BAY WATERSHED

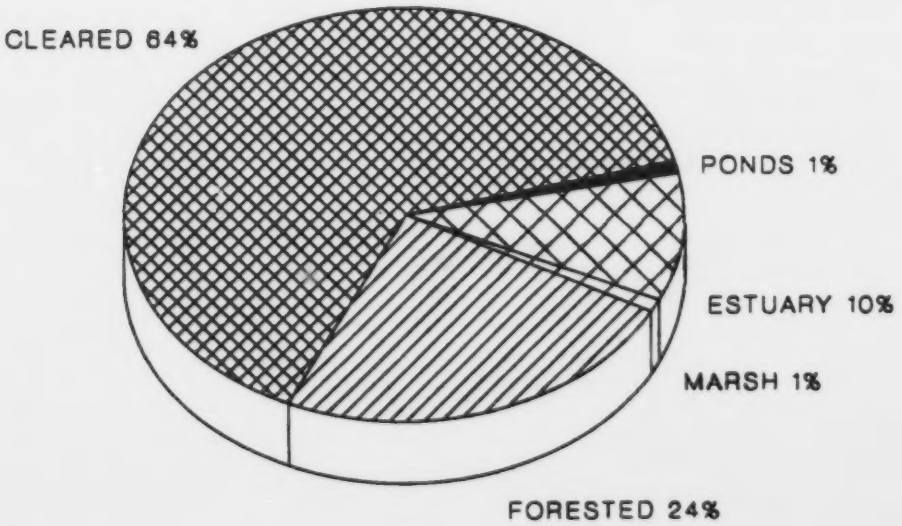


Figure 2.1 Physiographic Comparison Between Prince Edward Island and the New London Bay Watershed Complex

available in full. The total drainage area and the length of streams are available for the Stanley and Southwest Rivers only.

2.2 Soils

Prince Edward Island's podzol soils, formed mainly from the weathering of sandstone and the deposition of glacial till, are generally stone-free, sandy and permeable. The New London Bay Watershed Complex is composed of varying amounts of Class 2S, 3S, 3T, 4T, $4^{T}s$, 5T, $5^{S}w$, 7S and 7T soils. Approximately fifty percent (50%) of the soils are Class 2, twenty percent (20%) Class 3, fifteen percent (15%) Class 4, ten percent (10%) Class 5 and five percent (5%) Class 7 (Canada Land Inventory, 1968).

3.0 AGRICULTURAL OPERATIONS

Agriculture forms a major part of Prince Edward Island's economy. Many parts of the watershed are well-suited for crop and livestock operations. There are a total of forty-nine (49) major livestock operations located throughout the watershed (Maps 11L/5, 11L/6 and 11L/12). Crop production is also evident with the major crops being potatoes, hay, oats, barley, corn and clover.

3.1 Dairy Operations

There are thirty-three (33) dairy operations located in the New London Bay Watershed Complex (Figure 3.1). Each contains at least thirty (30) or more head (30 milkers and 30 feeders) of cattle (Newson, 1989).

3.2 Beef Operations

Seven beef cattle operations (Figure 3.1) with fifty (50) or more head (50 cattle plus 50 feeders) are present in the watershed (Murphy, S., 1989).

3.3 Hog Operations

Seven hog operations (Figure 3.1) are in the boundaries of the watershed. Each has an annual production of eight hundred (800) or more animals (Johnson, 1989). Since hogs are normally housed indoors the only threats to surface water quality are as a result of the improper storage and disposal of manure.

3.4 Poultry Operations

There are also two large scale poultry farms (Figure 3.1) in the watershed (Johnson, 1989).

Figure 3.1 Livestock Operations Located Within the New London Bay Watershed Complex

3.5 Stock Watering

Most livestock on Prince Edward Island are watered using groundwater piped into troughs (Murphy, S., 1988). There have been some instances noted within the New London Bay Watershed Complex in which animals were observed drinking from streams traversing the pastures (refer to Section 11.2). This leads to destabilization of the stream banks and siltation and bacterial contamination of the water.

3.6 Irrigation

The Prince Edward Island Department of Agriculture does not keep specific records on irrigation occurring within the province. Water used for irrigation generally comes from a surface water source such as a farm pond or stream. In dry years there are more farmers than usual who irrigate their crops (Clough, 1988). This practice may affect the amount of water available for users in downstream locations. Therefore, a monitoring system should be in place so as not to jeopardize the amount of water available to other users.

3.7 Dead Stock Burial

There are not any known dead stock burial sites located in the watershed. Farmers can either pay a service fee to have their stock discarded at an approved disposal site or they can sell their dead animals to Maritime Pet Foods which is located in Hunter River. They can also bury the carcasses on their own land (which is the most likely scenario).

3.8 Erosion Control Projects

Eight erosion control projects are located in the New London Bay Watershed Complex. Five are tile drainage projects (Maps 11L/5 and 11L/6), two are grassed waterways (Map 11L/5), while the other is a combination tile drainage-grassed waterway project (Map 11L/6), (Pharo, 1989). Tile drainage projects have enabled farmers to increase the productivity of low class agricultural lands (DeHaan, 1989).

4.0 FISH AND WILDLIFE RESOURCES

Fish and wildlife resources are important to both residents and tourists alike on Prince Edward Island in terms of the recreational and economic benefits they provide. Fish and wildlife on P.E.I. are dependent upon surface water resources either for primary habitat or as a source of drinking water.

4.1 Angling Areas

There are a number angling sites along the rivers (Maps 11L/5, 11L/6 and 11L/12) including five listed in Angling on Prince Edward Island (P.E.I. Department of Tourism and Parks, 1988).

4.2 Hunting Areas

The entire area is good for waterfowl hunting (Clements, 1989). The numerous grain fields provide an abundant supply of food for waterfowl during their annual migrations. The many woodlots and hedgerows separating agricultural fields provide suitable habitat for such upland game species as; snowshoe hare, ruffed grouse, Hungarian partridge, snipe and woodcock (Maps 11L/5, 11L/6 and 11L/12). Since wildlife is known to be migratory, in response to habitat requirements and food availability, their boundaries are not static from year-to-year.

4.3 Trapping Areas

As with hunting areas, the trapping areas located within the New London Bay Watershed Complex (Maps 11L/5, 11L/6 and 11L/12) do not have consistent boundaries from year-to-year (Hurry, 1989). They are dependent both upon the movement of animals and the preferences of trappers. Some of the species which are trapped within the watershed include muskrat, fox, mink and snowshoe hare. The amount of trapping activity also depends on the fur market conditions.

5.0 RECREATIONAL ACTIVITIES

Surface water and some recreational activities go hand-in-hand (swimming and boating). Other activities (hiking and skiing) are often enjoyed in close proximity to streams and rivers. Similarly, major recreational facilities (provincial parks and campgrounds) are generally situated adjacent to Island surface water resources.

5.1 National Parks / Provincial Parks / Private Campgrounds

Prince Edward Island National Park is partly situated in the New London Bay Watershed Complex. It is near the Village of Stanley Bridge (Map 11L/6) and offers a wide variety of services and activities including birdwatching and swimming.

A portion of Prince Edward Island National Park (Cavendish Sandspit) forms the northern boundary of the watershed (Map 11L/12). The Sandspit represents only a small segment of the park but is important as a nesting area for shorebirds,

especially the endangered Piping Plover. The relative remoteness of the sandspit prevents a significant amount of recreational activity except for the occasional boaters, hikers and birdwatchers. The main camping areas in the park are outside of the New London Bay Watershed Complex.

There is one provincial park located within the watershed. Devil's Punchbowl Provincial Park is located near Granville (Map 11L/6) and offers picnic, day-use and campsite facilities.

There is one private commercial campground. Cavendish Sunset Campground has two hundred and fifteen (215) sites which include forty-five (45) flush toilets and thirty (30) showers. Wastewater is disposed of through septic systems and is monitored jointly by the P.E.I. Department of the Environment and the P.E.I. Department of Health and Social Services (Davies, 1989).

Seventy-three (73) additional private accommodation's facilities are also found in the watershed. These range from bed and breakfast operations to large motels and campgrounds. Various activities are available at some of the sites including swimming, angling, clam digging and boating (P.E.I. Department of Tourism and Parks, 1989).

5.2 Swimming Areas

Generally, people will swim where they desire. In P.E.I. many of the best swimming areas are coastal. This excludes much of the New London Bay Watershed Complex.

The only organized swimming activities on the Island occur through the Canadian Red Cross Society which does not conduct swimming events in the New London Bay area (MacLean, 1989). Ponds, areas near bridges and the wider sections of the rivers would be those most concentrated with swimmers. The sand bars on New London Bay which are exposed at low tide are also excellent areas for swimming.

5.3 Boating / Canoeing Areas

The Prince Edward Island Recreational Canoeing Association is able to provide information on various canoeing routes throughout the province but does not offer any organized trips (P.E.I. Department of Tourism and Parks, n.d.). The Southwest River is good for canoeing from the entrance point at New London Bridge on Highway #20. One can travel upriver and turn at Long River or Harding Creek before returning to the Bridge.

The Stanley River is accessible via the launching area at Stanley Bridge on Route #6. From there, one can travel up the river until they exit at Millvale.

New London Bay, itself, is good for canoeing except where it exits into the Gulf of St. Lawrence. One can also enter any of the four major rivers which flow into the Bay (Maps 11L/5, 11L/6 and 11L/12).

New London Bay is a popular boating area and has numerous areas for launching boats and canoes (Maps 11L/5, 11L/6 and 11L/12). The launching sites located at New London, Stanley Bridge and French River are all at the fishing wharves. Others, such as the Trout River bridge, are found at road-stream intersections. There are also other points which are maintained by tourist operators at various boat rental locations.

Boardsailing is gaining popularity on P.E.I. New London Bay is fairly sheltered and provides good windsurfing opportunities. The major rivers have significantly large open areas and are excellent for boardsailing.

5.4 Hiking / Cross-Country Skiing / Snowshoeing

For the nature-buff or recreational enthusiast a good method in which to see an area is on foot either by hiking, cross-country skiing or snowshoeing. In this way, people can go at their own pace, perhaps photographing what catches their eye or just enjoying the great outdoors.

There are not any organized hiking or cross-country trails within the New London Bay Watershed Complex although the several woods' roads and unpaved roads are well-suited for this purpose.

Snowshoeing may be undertaken anywhere within the watershed. However, the areas utilized for hiking and/or cross-country skiing most likely have the highest use for snowshoers as well.

5.5 Snowmobiling / Horseback Riding

There are not any snowmobiling clubs and therefore no organized excursions. Individuals and groups of snowmobilers are often observed riding through fields and along woods' and seasonal roads.

There are not any commercial horseback riding operations in the watershed. However, there have been horses noted in several of the pastures and it is assumed that recreational trail riding occurs on a limited scale.

5.6 Unplowed (Seasonal / Scenic Heritage) Roads

Many local and unpaved roads are not open for vehicular traffic during the winter months (Maps 11L/5, 11L/6 and 11L/12). Their relative abundance provide additional venues for winter recreational activities such as cross-country skiing, snowshoeing and snowmobiling. Often not well used during the warmer months they further supply recreational opportunities for hiking, cycling and horseback riding.

Several roads across the Island have been designated as Scenic Heritage roads as a result of their natural and historical significance. Four roads in the New London Bay Watershed Complex have been so designated (Maps 11L/5, 11L/6 and 11L/12), (Horne et. al., 1988).

6.0 FISHERIES OPERATIONS

The fishing industry is very important to the economy of Prince Edward Island. All of the province's major watersheds have an estuarial component which supports a fishery to some extent. The value of the fish and shellfish species landed in the New London Bay Watershed Complex during 1987 was over two hundred and thirty-three thousand dollars ($233,451), (Figure 6.1). All finfish and shellfish harvests can be placed into three general categories, namely; licensed commercial, non-licensed commercial and recreational and finfish aquaculture.

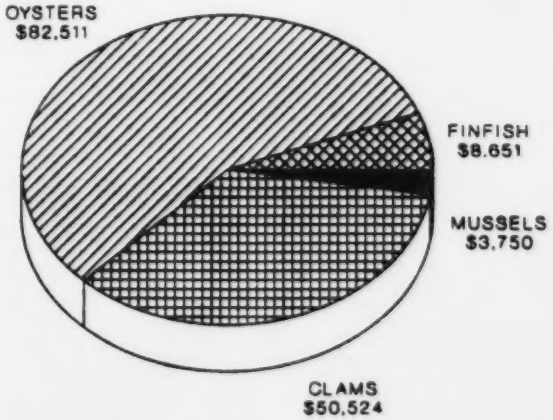


Figure 6.1 1987 Fish/Shellfish Landings Within the New London Bay Watershed Complex

6.1 Licensed Commercial

Some areas of the New London Bay Watershed Complex are classed as public fishing domain. As such, there are no suspended or ground shellfish leases and any fisherman can

remove shellfish in season. Other areas are specific leased areas or zones and can be fished only by the lease owner. There are forty-five (45) mussel leases, twenty-five (25) oyster leases and two finfish leases in the watershed (Maps 11L/5, 11L/6 and 11L/12), (Small, 1989).

The primary public oyster and quahog harvesting areas in the New London Bay Watershed Complex are indicated on Maps 11L/5, 11L/6 and 11L/12. Soft-shelled clams are harvested in the New London Bay on both a commercial and non-commercial basis. Shellfish concentrations have been identified by Department of Fisheries and Oceans personnel (McInnis, 1989).

The New London Bay Watershed Complex is open to eel netting on a seasonal basis from August 15 to November 30 and to eel spearing year round. Smelt catches are regulated by season and are monitored by Department of Fisheries and Oceans staff. Box, gill and bag nets are used to trap smelt during the annual season (October to February).

6.2 Non-Licensed Commercial / Recreational

Trout, mackerel and smelt are harvested in New London Bay on a recreational basis. Bar clams, soft-shelled clams and mussels are also taken from public fishing areas.

Despite the closure of some parts of the Hope, French, Southwest and Stanley Rivers as a result of bacterial contamination the watershed currently supports significant non-licensed commercial and recreational finfish and shellfish harvests. Any shellfish which are removed from the contaminated areas must be transferred to unpolluted areas for flushing (a period of three to four weeks). However, those people who harvest shellfish from contaminated areas must first obtain a conditional permit from the Department of Fisheries and Oceans.

6.3 Aquaculture Operations

There are two finfish aquaculture sites in the New London Bay Watershed Complex. One, at Long River (Map 11L/5), raises approximately seventy thousand (70,000) rainbow trout and five thousand (5,000) brook trout. A combination of well and surface water are withdrawn for the operation at a rate of about 540 litres per minute. The other facility, which is located at Glynde River (Map 11L/6), contains about ten thousand (10,000) Atlantic Salmon and uses approximately 1350 litres per minute each of groundwater and surface water. Neither operation has a waste treatment facility in operation.

Two small sea cage operations are also located within the watershed. One is near the New London Wharf (Map 11L/5) while

the other is located near the Stanley Bridge Wharf (Map 11L/6), (Murphy, L., 1989).

7.0 INDUSTRIAL OPERATIONS

Many of the industrial operations located on Prince Edward Island have an effect on surface water resources in one way or another. Some discharge both treated and untreated wastes directly into streams and rivers while others allow for the seepage of pollutants to surface or groundwater sources. Some industrial operations require a surface water or groundwater source for use in their processes.

7.1 French River Cannery (1986) Ltd.

The watershed has one food processing operation located within its boundaries. French River Cannery (1986) Ltd. operates a cannery at French River (Map 11L/12). They sell fresh fish and also can lobster, bar clams, chicken and other products of opportunity.

7.2 Abandoned, Active and Unapproved Dump Sites

During 1982-83, the P.E.I. Department of Community and Cultural Affairs, in conjunction with Environment Canada, performed a study in which abandoned, active and unapproved waste disposal sites on Prince Edward Island were located and inspected (Water Resources Section, 1983). Of prime concern during this inventory was the potential for groundwater contamination. Twelve sites were identified within the New London Bay Watershed Complex (Maps 11L/5, 11L/6 and 11L/12).

As part of the inventory a scoring system was used to rate and priorize (Priority I, II and III) each site on the basis of actual and potential environmental effects. Priority I sites were rated as being most hazardous to the environment; Priority II dumps were less hazardous; while Priority III sites were generally very small discriminate sites which were not considered to be environmentally hazardous. Evaluation of the abandoned sites revealed one Priority II and eleven Priority III dumps.

The Air and Solid Wastes Branch of the P.E.I. Department of the Environment has also identified four active approved dumps. One is a container site located at St. Ann while the others are landfills located outside of the villages of French River, Stanley Bridge and Spring Valley (Maps 11L/5, 11L/6 and 11L/12), (Curley, 1989).

There is not an established program for hazardous waste disposal on Prince Edward Island (Curley, 1988). However, the

Air and Solid Wastes Branch cooperates with their federal counterparts in controlling toxic waste disposal. For example, asbestos, which has been removed from buildings is double-bagged and dumped at landfill sites. Agricultural pesticides are sometimes left at dumpsites illegally. Since it is difficult to regulate such practices, remnant chemicals could become a potential hazard to both surface and groundwater resources.

The only other major form of toxic wastes on P.E.I. are polychlorinated biphenols (PCB's). As these compounds do not break down under normal conditions, they must be stored until they can be transported to a proper disposal site (located off-Island). There are not any registered PCB users or PCB storage sites located within the New London Bay Watershed Complex (Guardian - Patriot, 1988). Hazardous materials are not generated in significant amounts to cause any serious threats to its surface water resources.

7.3 Excavation Pits

Scattered throughout Prince Edward Island are numerous excavation pits used for the private and commercial removal of sandstone, and to lesser amounts, gravel and sand. Nine registered active excavation pits (Maps 11L/5, 11L/6 and 11L/12) are found in the watershed (Eaton, 1989). Records are not kept concerning the quantity of material removed from the individual pits and there are other pits for which permits have not been obtained. As well, records are not maintained concerning the number of non-operational or abandoned pits (Murphy, C., 1988).

7.4 Salt / Sand Storage Locations

The P.E.I. Department of Transportation and Public Works maintains a number of salt/sand storage areas across the Island. At these temporary sites, the salt and sand is stored directly on the ground with little or no site preparation. Often, the locations of these secondary sites change thereby yielding both abandoned and active sites. There is one active salt/sand storage site in the community of French River (Map 11L/12).

7.5 Snow Disposal Sites

There are not any major problems with snow accumulation on streets and roads due to the small size of the communitites in the watershed. Snow is plowed either into the ditch or the nearest open field or lot. The effects of this activity on surface water resources are minimal.

7.6 Additional Industrial Activities

A number of sawmills across the Prince Edward Island are operated as small businesses. Some of the mills are mobile (usually powered by tractors) and will process wood at the lot while others are fixed and are powered by water, generators or electricity. There is one permanent sawmill located within the watershed at Bayview (P.E.I. Development Agency, 1986). A second operation, located during fieldwork, is at Millvale (Map 11L/6). Sawmill waste can increase the biological oxygen demand of waterways and, in some cases, cause increases in the acidity of the water (Godfrey, 1989).

8.0 ALTERATIONS OF NATURAL FEATURES OF WATERWAYS

Individuals or groups wishing to alter a water system directly or indirectly to improve its recreational potential, to provide a reservoir for agricultural purposes or fire protection or to construct a stream crossing must seek approval from the Water Resources Branch of the P.E.I. Department of the Environment (Environmental Protection Act, Sections 10 and 11).

8.1 Application Process and Requirements

Alteration applications are subject to government control under the P.E.I. Environmental Protection Act (Section 10) and the Canada Fisheries Act (Chapter F-14, Section 20). Before requests are given final approval by the Head of the Watercourse Alteration Advisory Committee, they are reviewed by several Federal/Provincial Government and private agencies. Once approval is granted, inspections are carried out to ensure that the recommendations of the Committee are being followed.

Application considerations include the following criteria: the well-being of the fisheries resource; possible changes in water quality; stream-side cutting leading to loss of essential food and cover for wildlife; and the effects of the alteration on other types of wildlife.

Types of alterations include; installation of dams and/or fishways, bypass pond construction, roadway culvert installation, rock gabion installation and the infilling of marshes. Infilling applications, most often, are rejected since the practice results in a loss of wildlife habitat.

Since P.E.I. soils are highly susceptible to erosion, proponents who alter waterways must undertake erosion control measures throughout the construction process.

8.2 Dam Inspections

The twenty (20) dams in the New London Bay Watershed Complex (Maps 11L/5, 11L/6 and 11L/12) were inspected during the Watershed Inventory Project. Descriptions of the dams are contained in Appendix A. Some were found to constitute a barrier to fish passage due to a variety of reasons including design of the dams, breaching, breakdown of the structures or debris within the waterways (See Section 11.3).

There are often repairs made to design flaws of roadway culverts which permit the passage of fish through the structures. This involves the installation of baffles or back flow devices which allows for decreased water velocities and increased depth in the structures.

8.3 Fishways

On Prince Edward Island, whenever an alteration is made to a waterway, the continued passage of fish must be ensured [Canada Fisheries Act, Chapter F-14, Section 20, (1)]. This involves, in some cases, the construction of a fishway. Various fishway designs are available with the type constructed dependent upon the species of fish to be passed and the water level fluctuations within the impoundment.

Four fishways were identified and field checked within the New London Bay Watershed Complex. Two, located at Hardys Pond (Map 11L/5) and Millvale Pond (Map 11L/6), are of the pool-and-weir design (7-step and 9-step, respectively) while the others are at the upper and lower ends of Henrys Pond (Map 11L/6) near Granville. The upper fishway is a combination 6-step vertical slot 4-step pool and weir. The lower fishway is a 5-step vertical slot design. The center and bottom steps in this fishway are in disrepair and present a complete barrier to fish passage.

8.4 Road - Stream Intersections

The P.E.I. Department of Transportation and Public Works maintains a reference map which provides an up-to-date record of all major highway structures, that is, those over 1.2 metres in diameter, within the province. The New London Bay Watershed Complex contains forty-seven (47) such structures (Maps 11L/5, 11L/6 and 11L/12).

The Watershed Inventory Project also identified fifty (50) additional road-stream intersections which, due to their small size, are not kept on file at the Department of Transportation and Public Works (Maps 11L/5, 11L/6 and 11L/12) but not all have been field checked. These areas were located via 1:50,000 N.T.S. maps.

8.5 Rail - Stream Intersections

Earlier this century, railroads on Prince Edward Island were a vital component in the transportation of goods across the Island. However, due to increased rail costs and more efficient trucking methods, its importance is rapidly decreasing. All lines across the province will be abandoned effective January 1990. Once the line is abandoned, CN Real Estate will contract out for the removal of the ties and rails. Crossing structures are not usually removed since they are often more useful if left in place.

There are not any rail lines located within the New London Bay Watershed Complex.

9.0 WETLANDS

Wetlands include salt marshes, intertidal flats, bogs, freshwater marshes, swamps and ponds. They are important for many reasons (Canadian Wildlife Service, n.d.):

1. as wildlife habitat;
2. act as natural filters;
3. bind pollutants thereby slowing the eutrophication process;
4. reduce flooding by acting as reservoirs; and
5. recharge the groundwater supplies.

During 1983 - 84 any wetlands on Prince Edward Island which measured over 0.25 hectares in size were inventoried. The objective of this program was to provide information on the classification, size, distribution and wildlife value of P.E.I. wetlands.

9.1 Freshwater Wetlands

All freshwater wetlands within Prince Edward Island were identified during the wetland inventory and were given a wildlife value based on a wide array of parameters. The wetlands received a score between 36 and 108 with a score of 60+ indicating generally more productive areas.

Fifteen freshwater wetlands with a score of 60+ were delineated within the New London Bay Watershed Complex (Maps 11L/5, 11L/6 and 11L/12), (Canadian Wildlife Service, n.d.).

9.2 Coastal Wetlands

Coastal wetlands were classified and scored as coastal units during the wetland inventory. The coastal unit score was calculated using the total of the scores from six component

types of wetlands along with five additional factors. Added to that was a value for the disturbance status of the unit. The total coastal unit score indicated its productivity and provides a measure of its importance to wildlife. The scores ranged from 10 to 1500 points and were indicated as the sum of all wetlands within the unit.

There are forty (40) wetlands in the New London Bay Watershed Complex which can be classified as coastal units (Maps 11L/5, 11L/6 and 11L/12), (Canadian Wildlife Service, n.d.).

9.3 Ducks Unlimited Canada Management Sites

Ducks Unlimited Canada is active on Prince Edward Island in the enhancement and management of wildlife habitat. Several management techniques are employed for this purpose. Installation of water control devices such as drop inlets and stoplog control structures allow for the creation of ponds and the regulation of water levels in order to maintain optimal habitat conditions. Fishways are usually installed with the water level control structures in order to allow for the continued passage of fish into and out of the impoundment.

Four active Ducks Unlimited sites (Table 9.1), (Maps 11L/5 and 11L/6) are located in the watershed (Dibblee, 1989).

Table 9.1 Ducks Unlimited Canada Management Sites Located Within The New London Bay Watershed Complex

NAME	SIZE (HA)	SHORELINE (KM)	YEAR COMPLETED
Canns Pond	6.47	1.60	1976
Clinton	4.04	0.96	1978
Millvale	6.47	2.24	1980
MacKies Pond	12.18	2.70	1985

10.0 ADDITIONAL ACTIVITIES WITHIN THE NEW LONDON BAY WATERSHED COMPLEX

10.1 Hydrometric Stations / Water Chemistry Data

The first streamflow data collected in Prince Edward Island

was from the Dunk River at Rogers Mill between 1919 and 1935. There are not any hydrometric stations located within the New London Bay Watershed Complex. In addition to the hydrometric stations located throughout the Island, the Water Quality Branch, Inland Waters Directorate, Environment Canada, Moncton, New Brunswick also maintains somewhat limited data associated with the following studies:

- P.E.I. Groundwater Study (May 1972 - September 1973);
- P.E.I. Surface Water Quality Survey (July 1972);
- Water Quality Board National Water Quality Monitoring (April 1974 - March 1978); and the
- Toxic Chemical Survey (1985).

Parameters monitored included the following: major ions, physical parameters, nutrients, metals and toxic substances.

10.2 Cavendish Area Development Plan

Cavendish, P.E.I. is quite unique in that it is an area with a population of two hundred permanent residents that receives visits from over four hundred thousand (400,000) people during a three month summer tourist season. In 1989 a consulting firm submitted a draft report entitled An Official Plan For The Comprehensive Development Of The Cavendish Planning Area to the Cavendish Planning Board. The planning area encompasses a section of the New London Bay Watershed Complex (Map 11L/6). In addition to a number of other points the issue of surface water contamination was addressed. The adoption of this or another official plan will be the first step in the control, maintenance and restoration of surface water resources in this area.

10.3 Headland Erosion Monitoring

Parks Canada Branch of Environment Canada has monitored shoreline erosion as part of an ongoing study of erosion within Prince Edward Island National Park. The annual rates of erosion for numerous sites within the watershed dating back to 1981 are available from the office at the park.

11.0 ACTIVITIES AFFECTING SURFACE WATER RESOURCES WITHIN THE NEW LONDON BAY WATERSHED COMPLEX

Many of the problems affecting surface water resources within the New London Bay Watershed Complex occur as a result of the high erodibility of Island soils. Soil erosion is accelerated by poor agricultural, forestry and road maintenance and construction practices. The problems affecting surface water resources on P.E.I. can be placed into three general categories; sedimentation (siltation) sources, pollution point sources and instream obstructions.

11.1 Sedimentation (Siltation) Sources

The entry of soil into surface waterways is described by the Watershed Inventory Project as a sedimentation (siltation) source. Autumn tillage, particularly plowing with the slope and cultivation excessively close to the streams' edge, often results in extensive landwash and siltation of the Island's waterways. There are numerous examples of this practice in the watershed. Improper forestry operations, such as clearcutting on steep slopes and removal of greenbelts along streams and rivers, also provides for sedimentation of streams and rivers.

One of the major sources of siltation to Island waterways is due to the construction and maintenance of P.E.I. roads. Many roads on the Island are unpaved which present numerous potential sources of sedimentation. Improper grading of these roads, in particular, leaving a ridge of clay and sand at either edge allows runoff water to form channels resulting in erosion to the road surface. Water usually flows alongside these ridges until it "breaks" through usually at a road-stream intersection. This practice of grading also renders ditches, if present, useless.

Silt-loading of Island streams and rivers does not usually affect the waterway at the point of entry but its effects are impacted further downstream. Soil particles are carried by currents and deposited in the stream covering essential finfish spawning areas. Shellfish beds in the estuaries are also affected in that they are smothered by the silt.

11.1.1 Clinton

Stock watering in a section of Harding Creek (Map 11L/5), a tributary of the Southwest River, represents both a siltation and bacterial contamination source to the waterway.

11.1.2 Toronto

The fields along an unnamed tributary of the Hope River (Map 11L/6) have been plowed with the slope directly to its edge thereby allowing soil to enter the waterway.

11.1.3 South Granville

This Scenic Heritage Road represents a siltation source to an unnamed tributary of the Trout River. Spring runoff flows along the unditched road with soil entering into the stream at the road intersection (Map 11L/6).

11.1.4 Grahams Road

Stock watering at the head of Founds River (Map 11L/5), a tributary of the Stanley River, represents both a siltation and bacterial contamination source to the waterway.

11.1.5 Margate

Stock watering in Durants Creek (Map 11L/5), a tributary of the Southwest River, is creating extensive siltbeds in the waterway.

11.1.6 Springbrook

A gravel pit, located near Adams Creek (Map 11L/5), has steep unstabilized banks and constitutes a siltation source to the stream.

11.1.7 Bayview

The remaining earth works of a partially breached dam near Bayview (Map 11L/6) represents a siltation source to the Hope River.

11.1.8 Springfield

An ephemeral stream in a cultivated field (Map 11L/5) represents the headwaters of the Trout River. Each summer the streambed is plowed under and planted. In turn, the following spring, the stream is recharged and carries a new silt load to the downstream portion of the river.

11.2 Pollution Point Sources

The entry of non-natural substances into a surface waterway is known as a pollution point source. For example, fertilizer and manure runoff into surface waterways results in bacterial and chemical contamination of the system. Inadequately or improperly treated human sewage, stormwater drainage and the discharge of industrial effluents also contribute to the deterioration of P.E.I.'s surface water quality.

The most recent examples of pollution point sources on the Island have been the entry of petroleum products, specifically gasoline, into streams, rivers and groundwater aquifers. This has resulted from either transportation accidents or leakage from underground storage tanks.

The result of bacterial contamination is often the eutrophication of the aquatic system. As is the case with

siltation, the effects of many pollution point sources are felt in downstream areas. This can result in the closure of shellfish harvesting areas.

11.2.1 Clinton I

This unnamed tributary of Harding Creek (Map 11L/5) is subject to bacterial contamination as a result of stock watering.

11.2.2 Clinton II

Cull potatoes, dumped less than 4.0 metres from Harding Creek, represent a persistent source of bacterial contamination to the waterway (Map 11L/5).

11.2.3 Margate

Durant Creek flows through a beef feedlot operation thereby constituting both a siltation and bacterial contamination source to the Creek (Map 11L/5). The Creek, itself, has been severely eroded as a result of the feedlot operation.

11.2.4 Burlington

A small dam at a site on the Southwest River (Map 11L/5) has been built to provide a stock watering source. The pond was created without a bypass channel which would allow for fish passage and represents both a source of bacterial contamination and siltation.

11.2.5 Bel Creek

An unnamed pond, located on Bel Creek (Map 11L/5), a tributary of the Southwest River, is used for watering cattle and represents both a siltation and bacterial contamination source to the waterway.

11.2.6 South Granville

Stock watering from an unnamed tributary of the Trout River (Map 11L/6) causes bacterial contamination of the waterway.

11.2.7 St. Ann

Stock watering is occurring on an unnamed tributary of the Hope River (Map 11L/6) thereby causing bacterial contamination and siltation of the waterway.

11.3 Instream Obstructions

Numerous other factors also influence the quality of the

surface waterways within the New London Bay Watershed Complex. Fallen trees or other debris in the streams and rivers present problems for fish passage. Improperly installed and unmaintained culverts, insufficient water flow and non-existent or inadequate dam bypass structures not only pose barriers to successful fish passage but also affect the amount of water available for use in downstream areas by other proponents.

11.3.1 South Granville

A culvert at the intersection of an unnamed tributary of the Trout River and Route #230 (Map 11L/6) has been set at an angle of ten to fifteen degrees. There is also a 0.08 metre drop from the end of the culvert to the plunge pool which has a depth of 1.50 metres. Water depth in the culvert is too shallow to allow for the passage of fish beyond this point.

11.3.2 French River

The waterlevel control device for Bernards Pond (Map 11L/12) on the French River represents a complete barrier to fish passage.

11.3.3 Clinton I

The dam at Clinton Pond (Map 11L/5) on Harding Creek is a complete barrier to fish passage. There are two vertical drops, 2.0 metres and 0.70 metres, in addition to a 2.0 metre drop over an incline of forty-five degrees (45°).

11.3.4 Clinton II

A pond located at Clinton (Map 11L/5) receives runoff from a small unnamed tributary of Harding Creek and allows no water to exit. It appears that evaporation is the only way water leaves the pond. The dam is a complete barrier to fish passage.

11.3.5 Bayview

The dam at Lower Simpsons Pond (Map 11L/6) on an unnamed tributary of the Hope River has a 2.0 metre vertical drop with no fishway and is a complete barrier to fish passage.

11.3.6 Long River

The angle of the culvert at the intersection of an unnamed tributary of the Southwest River and Route #262 (Map 11L/5) is too steep and the water too shallow to allow for fish passage.

11.3.7 Paynters Pond

The water level control device at Paynters Pond (Map 11L/5) on the Long River is a drop inlet which has a vertical drop of 8.0 metres.

11.3.8 Founds Mill

The downstream end of the culvert at the intersection of Founds River and Route #238 (Map 11L/6) is a complete barrier to fish passage. There is a vertical drop of 0.25 metres into a plunge pool of 0.20 metres.

11.3.9 Margate

The downstream end of the culvert at the intersection of Durant Creek and Route #233 (Map 11L/5) has a vertical drop of 0.30 metres into a plunge pool of 1.50 metres. This represents a partial barrier to fish passage. Stock watering was also evident at this site.

11.3.10 Spring Valley

The intersection at an unpaved road and the Southwest River (Map 11L/5) has the potential to be a barrier to fish passage during periods of low water. The crossing had a water depth of 0.15 metres in the culvert, a vertical drop of 0.35 metres and a plunge pool depth of 0.35 metres.

11.3.11 Burlington

The top step of the 7-pool and weir fishway located at Hardys Pond (Map 11L/5) on the Southwest River has been blocked by the owner to increase pond depth. This has created a complete barrier to fish passage.

11.3.12 Springfield

The intersection at Granville Creek (tributary of the Stanley River) and Route #254 (Map 11L/5) is a complete barrier to fish passage as the water makes a 1.35 metre drop as it leaves the downstream end of the culvert. A field located downstream of the culvert has been plowed to the edge of the stream. Stock watering is evident on the upstream side of the culvert.

11.3.13 Henrys Pond

The 5-step pool and weir fishway at the lower end of Henrys Pond (Map 11L/6) on Granville Creek is in a state of disrepair. The first and third steps both present a complete barrier to the successful passage of fish.

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APPENDIX

APPENDIX A

New London Bay Watershed Complex Dam Inspection

Name	UTM Location

Lower Simpsons Pond — 468300-5145900

The dam for this mill pond is a complete barrier to fish passage. Water flowing over the dam has a 2.0 meter drop to stream level.

Upper Simpsons Pond — 468800-5145800

The dam has been breached causing silt loading in the stream. There is, however, no barrier to fish passage at the breach.

Henrys Pond — 463700-5141300

Not checked.

Clinton Pond — 457700-5143700

This pond is drained through a drop inlet and allows no fish passage. The drop inlet has a 2.0 metre slide, set at about 45°, and then a 0.75 metre drop.

Canns Pond — 453700-5143100

This pond has a bypass channel with a vertical drop of about 5.0 metres which may present which may present a barrier to some species (such as smelt and gaspereau). Stock watering at the head of the channel represents both a siltation and bacterial contamination source.

MacLeods Pond — 453100-5148400

This pond has a bypass channel with a vertical drop of approximately 4.0 metres. A 1.0 metre drop in the channel represents a complete barrier to fish passage although trout were seen in the pond.

Bernards Pond 460000-5151400

This pond has no bypass and is, therefore, a complete barrier to fish passage.

Paynters Pond 458100-5148200

This millpond drains through a drop inlet 5.0 metres high and represents a complete barrier to fish passage.

Harding Creek 457500-5143200

The dam at this location was not found.

Tuplin Creek 453300-5144100

A very small bypass pond which presents no barrier to fish passage.

Hardys Pond 454300-5147400

This dam has a seven step Denil fishway which has been blocked by the owner, creating a complete barrier to fish passage. The overall vertical drop is about 5.0 metres.

Irishtown 454300-5148400

This newly constructed, small, stock watering pond is both a siltation and a bacterial contamination source. It has a 0.20 metre vertical drop and is above any area of fish movement.

Eel Creek 465400-5147700

This stock watering site has a bypass stream with a vertical drop of 1.0 metre. It is a source of bacterial contamination and a potential siltation source.

Trout River 458200-5144100

This pond, which is used as a fish rearing site, is a complete barrier to fish passage.

Murphys Pond (Millvale) 467500-5139400

This millpond has a nine step Denil fishway and a vertical drop of about 3.0 metres. No barrier.

South Granville 464300-5137100

This small bypass pond is used for stock watering and represents a siltation source. It has a 0.10 metre vertical drop to a plunge pool of 0.10 metres and is a partial barrier to fish passage.

Founds River 459300-5140800

This bypass pond has an overall drop of about 1.0 metre and poses no problems for the passage of fish.

Granville (Mallets) Pond 462700-5140700

The dam at this site was breached 5 to 8 years ago.